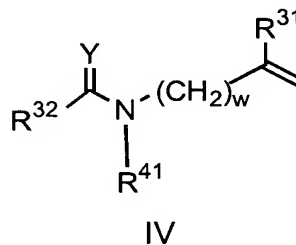
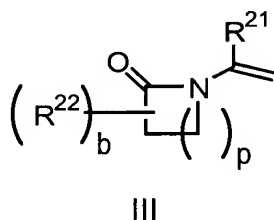
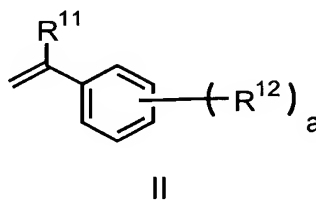
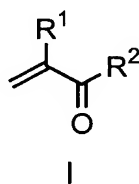


What is claimed is:

1. An antimicrobial lens comprising silver and a polymer comprising a monomer of Formula I, II, III or IV



wherein

R^1 is hydrogen or C_{1-6} alkyl;

R^2 is $-\text{OR}^3$, $-\text{NH}-\text{R}^3$, $-\text{S}-(\text{CH}_2)_d-\text{R}^3$, or $-(\text{CH}_2)_d-\text{R}^3$, wherein

d is 0-8;

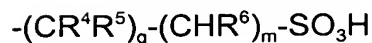
R^3 is substituted C_{1-6} alkyl

where the alkyl substituents are selected from one or more members of the group consisting of carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C_{1-6} alkyldisulfide, C_{1-6} alkylsulfide, phenyldisulfide, urea, C_{1-6} alkylurea, phenylurea, thiourea, C_{1-6} alkylthiourea, phenylthiourea, substituted C_{1-6} alkyldisulfide, substituted phenyldisulfide, substituted C_{1-6} alkylurea, substituted phenylurea, substituted C_{1-6} alkylthiourea, and substituted phenylthiourea

wherein the C_{1-6} alkyldisulfide, phenyldisulfide,

C_{1-6} alkylurea, C_{1-6} alkylthiourea, phenylurea, and

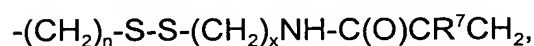
phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;



wherein R⁴, R⁵, and R⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

q is 1-6, and

10 m is 0-6;



wherein R⁷ is hydrogen or C₁₋₆alkyl,

n is 1-6, and

x is 1-6;



wherein R⁸, R⁹, and R¹⁰ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

t is 1-6, and

20 u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

25 pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

30 quinolinyl;

indolyl;

thiadiazolyl;
 triazolyl;
 4-methylpiperidin-1-yl;
 4-methylpiperazin-1-yl;
 substituted phenyl;
 substituted benzyl;
 substituted pyridinyl;
 substituted pyrimidinyl;
 substituted pyrazinyl;
 substituted benzimidazolyl;
 substituted benzothiazolyl;
 substituted benzotriazolyl;
 substituted naphthaloyl;
 substituted quinolinyl;
 substituted indolyl;
 substituted thiadiazolyl;
 substituted triazolyl;
 substituted 4-methylpiperidin-1-yl; or
 substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more
 members of the group consisting of C₁₋₆alkyl,
 haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
 hydroxyl, carboxylic acid, amine, amidine,
 N-(2-aminopyrimidine)sulfonyl,
 N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
 N-(2-aminopyrimidine)carbonyl,
 N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
 N-(2-aminopyrimidine)phosphonyl,
 N-(2-aminopyridine)phosphonyl,
 N-(aminopyrazine)phosphonyl,
 N-(aminobenzimidazolyl)sulfonyl,

N-(aminobenzothiazolyl)sulfonyl,
 N-(aminobenzotriazolyl)sulfonyl,
 N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
 N-(aminotriazolyl)sulfonyl,
 N-(amino-4-methylpiperidiny)lsulfonyl,
 N-(amino-4-methylpiperazinyl)sulfonyl,
 N-(aminobenzimidazolyl)carbonyl,
 N-(aminobenzothiazolyl)carbonyl,
 N-(aminobenzotriazolyl)carbonyl,
 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
 N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidiny)lcarbonyl,
 N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny)l phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,

hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

a is 1-5;

R¹¹ is hydrogen or C₁₋₆alkyl;

R¹² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid, acetamide, thioC₁₋₆alkylcarbonyl, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, -OR¹³, -NH-R¹³, -S-(CH₂)_d-R¹³, -(CH₂)_d-R¹³, -C(O)NH--(CH₂)_d-R¹³, -C(O)-(CH₂)_d-R¹³, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted phenylthiourea or substituted C₁₋₆alkylthiourea wherein the substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

where

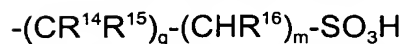
d is 0-8;

R¹³ is thioC₁₋₆alkylcarbonyl;
substituted C₁₋₆alkyl

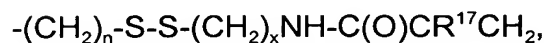
where the alkyl substituents are selected from one or more members of the group consisting of hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the

group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;



where R¹⁴, R¹⁵, and R¹⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl, q is 1-6, and m is 0-6;



where R¹⁷ is hydrogen or C₁₋₆alkyl, n is 1-6, and x is 1-6;



where R¹⁸, R¹⁹, and R²⁰ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl, t is 1-6, and u is 0-6;

phenyl;
benzyl;
pyridinyl;
pyrimidinyl;
pyrazinyl;
benzimidazolyl;
benzothiazolyl;
benzotriazolyl;
naphthaloyl;
quinolinyl;
indolyl;
thiadiazolyl;

triazolyl;
4-methylpiperidin-1-yl;
4-methylpiperazin-1-yl;
substituted phenyl;
substituted benzyl;
substituted pyridinyl;
substituted pyrimidinyl;
substituted pyrazinyl;
substituted benzimidazolyl;
substituted benzothiazolyl;
substituted benzotriazolyl;
substituted naphthaloyl;
substituted quinolinyl;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl

wherein the substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid, hydroxyl, carboxylic acid, amine, amidine, N-(2-aminopyrimidine)sulfonyl, N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl, N-(2-aminopyrimidine)carbonyl, N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl, N-(2-aminopyrimidine)phosphonyl, N-(2-aminopyridine)phosphonyl, N-(aminopyrazine)phosphonyl, N-(aminobenzimidazolyl)sulfonyl, N-(aminobenzothiazolyl)sulfonyl,

N-(aminobenzotriazolyl)sulfonyl,
 N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
 N-(aminotriazolyl)sulfonyl,
 N-(amino-4-methylpiperidiny)lsulfonyl,
 N-(amino-4-methylpiperazinyl)sulfonyl,
 N-(aminobenzimidazolyl)carbonyl,
 N-(aminobenzothiazolyl)carbonyl,
 N-(aminobenzotriazolyl)carbonyl,
 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
 N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidiny)lcarbonyl,
 N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny)l phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic

acid, amine, amidine, acetamide, and nitrile;

b is 1-5;

p is 1-5;

R²¹ is hydrogen;

R²² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid, thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, C₁₋₆alkyldisulfide, phenyldisulfide, -C(O)NH(CH₂)₁₋₆-SO₃H, -C(O)NH(CH₂)₁₋₆-P(O)(OH)₂, -OR²³, -NH-R²³, -C(O)NH-(CH₂)_d-R²³, -S-(CH₂)_d-R²³, -(CH₂)_d-R²³, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted, C₁₋₆alkylthiourea substituted phenylurea or substituted phenylthiourea wherein the substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile,

where

d is 0-8;

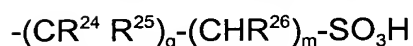
R²³ is thioC₁₋₆alkylcarbonyl,

C₁₋₆alkyl,

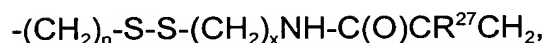
substituted C₁₋₆alkyl

where the alkyl substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, halo C₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea, and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;



where R²⁴, R²⁵, and R²⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl, q is 1-6, and m is 0-6



where R²⁷ is hydrogen or C₁₋₆alkyl, n is 1-6, and x is 1-6;



where R²⁸, R²⁹, and R³⁰ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl, t is 1-6, and u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

quinolinylyl;
 indolyl;
 thiadiazolyl;
 triazolyl;
 4-methylpiperidin-1-yl;
 4-methylpiperazin-1-yl;
 substituted phenyl;
 substituted benzyl;
 substituted pyridinyl;
 substituted pyrimidinyl;
 substituted pyrazinyl;
 substituted benzimidazolyl;
 substituted benzothiazolyl;
 substituted benzotriazolyl;
 substituted naphthaloyl;
 substituted quinolinylyl;
 substituted indolyl;
 substituted thiadiazolyl;
 substituted triazolyl;
 substituted 4-methylpiperidin-1-yl; or
 substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more
 members of the group consisting of C₁₋₆alkyl,
 haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
 hydroxyl, carboxylic acid, amine, amidine,
 N-(2-aminopyrimidine)sulfonyl,
 N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
 N-(2-aminopyrimidine)carbonyl,
 N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
 N-(2-aminopyrimidine)phosphonyl,
 N-(2-aminopyridine)phosphonyl,

N-(aminopyrazine)phosphonyl,
 N-(aminobenzimidazolyl)sulfonyl,
 N-(aminobenzothiazolyl)sulfonyl,
 N-(aminobenzotriazolyl)sulfonyl,
 N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
 N-(aminotriazolyl)sulfonyl,
 N-(amino-4-methylpiperidiny)lsulfonyl,
 N-(amino-4-methylpiperazinyl)sulfonyl,
 N-(aminobenzimidazolyl)carbonyl,
 N-(aminobenzothiazolyl)carbonyl,
 N-(aminobenzotriazolyl)carbonyl,
 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
 N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidiny)lcarbonyl,
 N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny)l phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and

phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

w is 0-1;

Y is oxygen or sulfur;

R³¹ is hydrogen or C₁₋₆alkyl;

R³² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid, thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, -C(O)NH-(CH₂)_d-R³³,

-O-R³³, -NH-R³³, -S-(CH₂)_d-R³³, -(CH₂)_d-R³³, C₁₋₆alkyldisulfide,

phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,

C₁₋₆alkylthiourea, phenylthiourea, C₁₋₆alkylamine, phenylamine,

substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted

phenylurea, substituted C₁₋₆alkylamine, substituted phenylamine,

substituted phenylthiourea, substituted C₁₋₆alkylurea or substituted

C₁₋₆alkylthiourea wherein the substituents are selected from the group

consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile

where

d is 0-8;

R³³ is thioC₁₋₆alkylcarbonyl,

C₁₋₆alkyl,

substituted C₁₋₆alkyl

where the alkyl substituents are selected from

one or more members of the group consisting of

C₁₋₆alkyl, halo C₁₋₆alkyl, halogen, hydroxyl,

carboxylic acid, sulfonic acid, phosphonic acid,

amine, amidine, acetamide, nitrile, thiol,

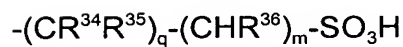
C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide,

urea, C₁₋₆alkylurea, phenylurea, thiourea,

C₁₋₆alkylthiourea, phenylthiourea, substituted

C₁₋₆alkyldisulfide, substituted phenyldisulfide,
substituted C₁₋₆alkylurea, substituted phenylurea,
substituted C₁₋₆alkylthiourea or substituted
phenylthiourea

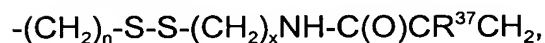
wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
phenylthiourea substituents are selected from the
group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl,
halogen, hydroxyl, carboxylic acid, sulfonic acid,
phosphonic acid, amine, amidine, acetamide, and
nitrile;



where R³⁴, R³⁵, and R³⁶ are independently selected
from the group consisting of hydrogen, halogen,
hydroxyl, and C₁₋₆alkyl,

q is 1-6, and

m is 0-6;



where R³⁷ is hydrogen or C₁₋₆alkyl,

n is 1-6, and

x is 1-6;



where R³⁸, R³⁹, and R⁴⁰ are independently selected
from the group consisting of hydrogen, halogen,
hydroxyl, and C₁₋₆alkyl,

t is 1-6, and

u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;
benzimidazolyl;
benzothiazolyl;
benzotriazolyl;
5 naphthaloyl;
quinolinyl;
indolyl;
thiadiazolyl;
triazolyl;

10 4-methylpiperidin-1-yl;
4-methylpiperazin-1-yl;
substituted phenyl;
substituted benzyl;
substituted pyridinyl;
15 substituted pyrimidinyl;
substituted pyrazinyl;
substituted benzimidazolyl;
substituted benzothiazolyl;
substituted benzotriazolyl;
20 substituted naphthaloyl;
substituted quinolinyl;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;

25 substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more
members of the group consisting of C₁₋₆alkyl,
haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
30 hydroxyl, carboxylic acid, amine, amidine,
N-(2-aminopyrimidine)sulfonyl,

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N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
 N-(2-aminopyrimidine)carbonyl,
 N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
 N-(2-aminopyrimidine)phosphonyl,
 N-(2-aminopyridine)phosphonyl,
 N-(aminopyrazine)phosphonyl,
 N-(aminobenzimidazolyl)sulfonyl,
 N-(aminobenzothiazolyl)sulfonyl,
 N-(aminobenzotriazolyl)sulfonyl,
 N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
 N-(aminotriazolyl)sulfonyl,
 N-(amino-4-methylpiperidinyl)sulfonyl,
 N-(amino-4-methylpiperazinyl)sulfonyl,
 N-(aminobenzimidazolyl)carbonyl,
 N-(aminobenzothiazolyl)carbonyl,
 N-(aminobenzotriazolyl)carbonyl,
 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
 N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidinyl)carbonyl,
 N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidinyl) phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted

C₁₋₆alkyldisulfide, substituted phenyldisulfide,
substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
substituted phenylurea, and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
phenylthiourea substituents are selected from the
group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
hydroxyl, carboxylic acid, sulfonic acid, phosphonic
acid, amine, amidine, acetamide, and nitrile;

R⁴¹ is hydrogen, C₁₋₆alkyl, phenyl, C₁₋₆alkylcarbonyl, phenylcarbonyl,
substituted C₁₋₆alkyl, substituted phenyl, substituted C₁₋₆alkylcarbonyl
or substituted phenylcarbonyl,

wherein

the substituents are selected from the group consisting of
C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid,
sulfonic acid, phosphonic acid, amine, amidine, acetamide,
and nitrile.

2. The antimicrobial lens of claim 1 comprising a polymer comprising a
monomer of Formula I.

3. The antimicrobial lens of claim 2 wherein,

R¹ is hydrogen or C₁₋₃alkyl;

R² is NH-R³;

d is 0

R³ is substituted phenyl, -(CR⁴ R⁵)_q-(CHR⁶)_m-SO₃H,

-(CR⁸R⁹)_t-(CHR¹⁰)_u-P(O)(OH)₂ or -(CH₂)_n-S-S-(CH₂)_xNH-C(O)CR⁷CH₂;

R⁴ is hydrogen or C₁₋₃alkyl;

R⁵ is hydrogen or C₁₋₃alkyl;

R⁶ is hydrogen or C₁₋₃alkyl;

q is 1-3;

m is 1-3;
R⁷ is hydrogen or C₁₋₃alkyl;
R⁸ is hydrogen or C₁₋₃alkyl;
R⁹ is hydrogen or C₁₋₃alkyl;
R¹⁰ is hydrogen or C₁₋₃alkyl;
t is 1-3;
u is 1-3;
n is 2-4; and
x is 2-4.

4. The antimicrobial lens of claim 2 wherein the lens is a soft contact lens.
5. The antimicrobial lens of claim 2 wherein the monomer of Formula I is present at about 0.01 to about 1.5 weight percent.
6. The antimicrobial lens of claim 2 wherein the monomer of Formula I is present at about 0.01 to about 0.8 weight percent.
7. The antimicrobial lens of claim 2 wherein the monomer of Formula I is present at about 0.01 to about 0.3 weight percent.
8. The antimicrobial lens of claim 2 wherein the monomer of Formula I is present at about 0.01 to about 0.2 weight percent.
9. The antimicrobial lens of claim 2 wherein the monomer of Formula I is present at about 0.01 to about 0.09 weight percent.
10. The antimicrobial lens of claim 2 wherein the lens is a silicone hydrogel.
11. The antimicrobial lens of claim 2 wherein, the lens is etafilcon A, balafilcon, A, aquafilcon A, lenefilcon A, or lotrafilcon A.

12. The antimicrobial lens of claim 2 wherein,

R¹ is hydrogen or methyl;

R² is NH-R³;

R³ is -(CR⁴R⁵)_q-(CHR⁶)_m-SO₃H, -(CR⁸R⁹)_t-(CHR¹⁰)_u-P(O)(OH)₂ or
-(CH₂)_n-S-S-(CH₂)_xNH-C(O)CHR⁷CH₂;

R⁴ is hydrogen or methyl;

R⁵ is hydrogen or methyl;

q is 1-2;

m is 1-2;

R⁶ is hydrogen or methyl;

R⁷ is hydrogen;

R⁸ is hydrogen or methyl;

R⁹ is hydrogen or methyl;

R¹⁰ is hydrogen or methyl;

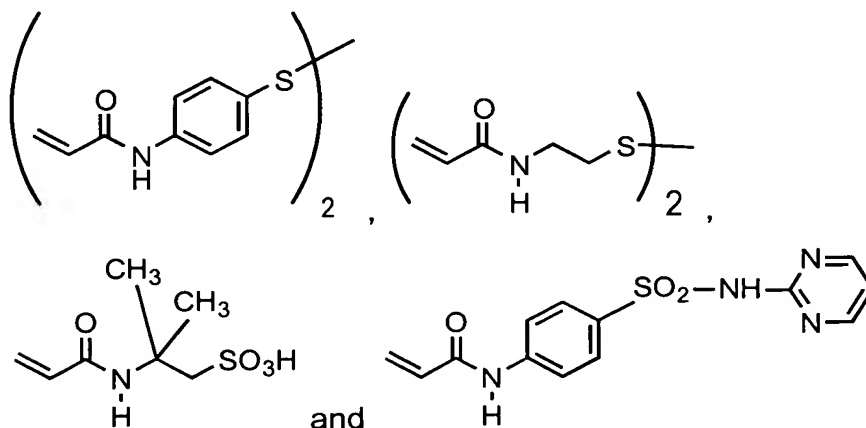
t is 1;

u is 1-2;

n is 2-3; and

x is 2-3.

13. The antimicrobial lens of claim 2 wherein the monomer of Formula I is selected from the group consisting of



14. The antimicrobial lens of claim 2 wherein silver is present at about 20 ppm to about 1,200 ppm.

5 15. The antimicrobial lens of claim 2 wherein silver is present at about 20 ppm to about 600 ppm.

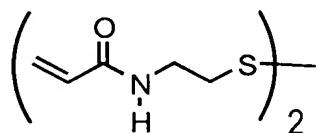
16. The antimicrobial lens of claim 2 wherein silver is present at about 20 ppm to about 150 ppm.

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17. The antimicrobial lens of claim 2 wherein silver is present at about 20 ppm to about 75 ppm.

18. The antimicrobial lens of claim 2 wherein the lens is a silicone hydrogel and the monomer of Formula I is

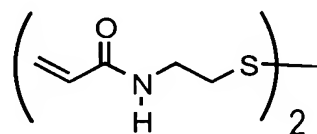
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19. The antimicrobial lens of claim 18 wherein silver is present at about 20 ppm to about 150 ppm and the monomer of Formula I is present at about 0.01 to about 1.5 weight percent.

20

20. The antimicrobial lens of claim 2 wherein the lens is etafilcon A, balafilcon, A, acquafilcon A, lenefilcon, or lotrafilcon A and the monomer of Formula I is

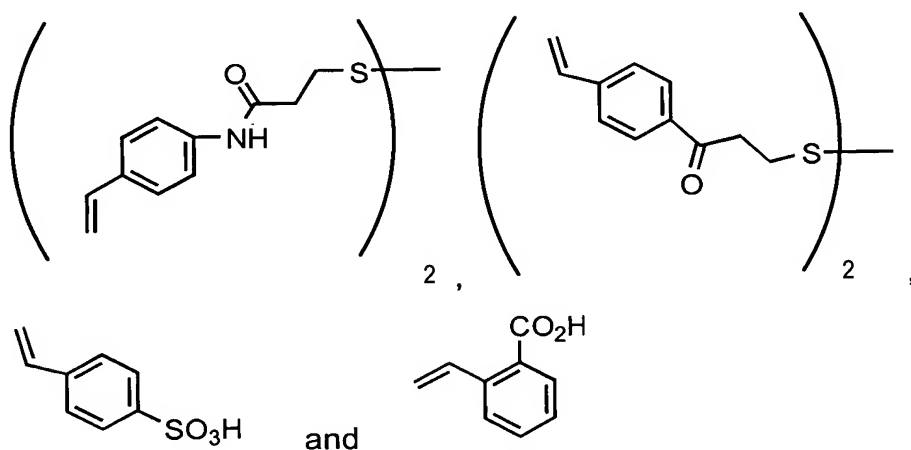


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21. The antimicrobial lens of claim 20 wherein silver is present at about 20

ppm to about 150 ppm and the monomer of Formula I is present at about 0.01 to about 1.5 weight percent.

22. The antimicrobial lens of claim 21 wherein the lens is etafilcon A.
23. The antimicrobial lens of claim 21 wherein the lens is acquafilcon A.
24. The lens of claim 23 wherein silver is present at about 20 ppm to about 75 ppm.
25. The antimicrobial lens of claim 1 comprising a polymer comprising a monomer of Formula II.
26. The antimicrobial lens of claim 25 wherein,
a is 1-2,
 R^{11} is hydrogen or C_{1-3} alkyl,
 R^{12} is sulfonic acid, carboxylic acid, phosphonic acid,
 C_{1-6} alkyldisulfide, C_{1-6} alkylsulfide, phenyldisulfide, substituted phenyldisulfide or $NH-R^{13}$,
 R^{13} is thio C_{1-6} alkylcarbonyl.
27. The antimicrobial lens of claim 25 wherein the monomer of Formula II is selected from the group consisting of



28. The antimicrobial lens of claim 25 wherein the lens is a soft contact lens.

5 29. The antimicrobial lens of claim 25 wherein the monomer of Formula II is present at about 0.01 to about 1.5 weight percent.

30. The antimicrobial lens of claim 25 wherein the monomer of Formula II is present at about 0.01 to about 0.8 weight percent.

10

31. The antimicrobial lens of claim 25 wherein the monomer of Formula II is present at about 0.01 to about 0.3 weight percent.

15

32. The antimicrobial lens of claim 25 wherein the lens is etafilcon A, balafilcon, A, aquafilcon A, lenefilcon A, or lotrafilcon A.

20

33. The antimicrobial lens of claim 25 wherein silver is present at about 20 ppm to about 150 ppm and the monomer of Formula II is present at about 0.01 to about 1.5 weight percent.

25

34. The antimicrobial lens of claim 33 wherein the lens is etafilcon A or aquafilcon A.

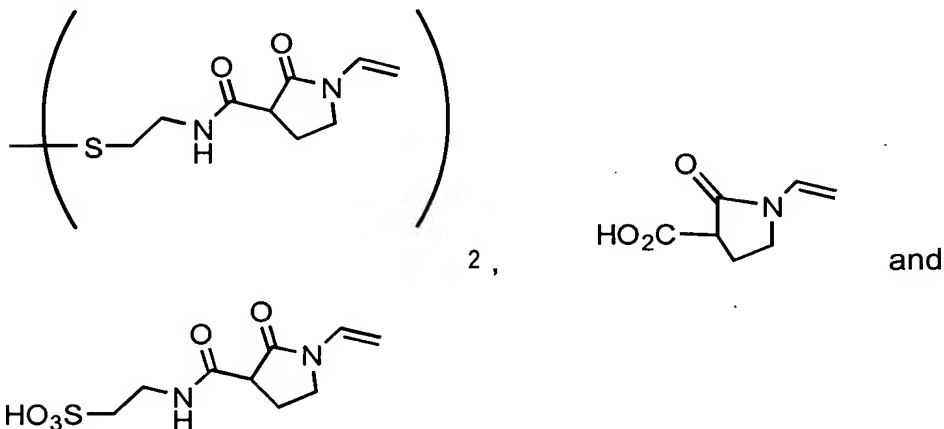
35. The antimicrobial lens of claim 1 comprising a polymer comprising a monomer of Formula III.

30

36. The antimicrobial lens of claim 35 wherein,
p is 1-3;
b is 1-2;
R²¹ is hydrogen;

R^{22} is sulfonic acid, phosphonic acid, carboxylic acid,
thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, C₁₋₆alkyldisulfide,
C₁₋₆alkylsulfide, phenyldisulfide, substituted phenyldisulfide,
H₃OS-(CH₂)₁₋₆NHC(O) or
(HO)₂(O)P-(CH₂)₁₋₆NHC(O)-.

37. The antimicrobial lens of claim 35 wherein the monomer of Formula III is selected from the group consisting of



38. The antimicrobial lens of claim 35 wherein the lens is a soft contact lens.

39. The antimicrobial lens of claim 35 wherein the monomer of Formula III is present at about 0.01 to about 1.5 weight percent.

40. The antimicrobial lens of claim 35 wherein the monomer of Formula III is present at about 0.01 to about 0.8 weight percent.

41. The antimicrobial lens of claim 35 wherein the monomer of Formula III is present at about 0.01 to about 0.3 weight percent.

42. The antimicrobial lens of claim 35 wherein, the lens is etafilcon A, balafilcon, A, aquafilcon A, lenefilcon A, or lotrafilcon A.

43. The antimicrobial lens of claim 35 wherein silver is present at about 20 ppm to about 150 ppm and the monomer of Formula III is present at about 0.01 to about 1.5 weight percent.

44. The antimicrobial lens of claim 43 wherein the lens is etafilcon A or aquafilcon A.

45. The antimicrobial lens of claim 1 comprising a polymer comprising a monomer of Formula IV.

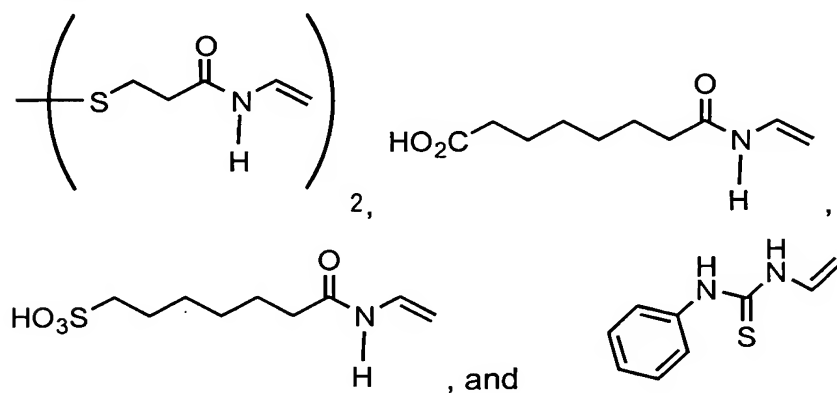
46. The antimicrobial lens of claim 45 wherein,
w is 0-1;

R³¹ is hydrogen;

R³² is amine, C₁₋₃alkylamine, phenylamine, substituted phenylamine;
thioC₁₋₃alkylcarbonyl;

R⁴¹ is hydrogen.

47. The antimicrobial lens of claim 45 wherein the monomer of Formula IV is selected from the group consisting of



48. The antimicrobial lens of claim 45 wherein the lens is a soft contact lens.

49. The antimicrobial lens of claim 45 wherein the monomer of Formula IV is present at about 0.01 to about 1.5 weight percent.

50. The antimicrobial lens of claim 45 wherein the monomer of Formula IV is present at about 0.01 to about 0.8 weight percent.

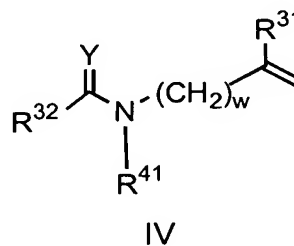
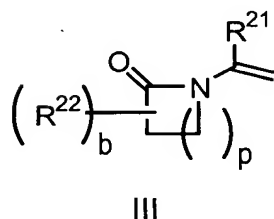
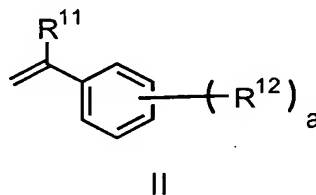
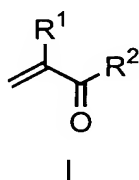
51. The antimicrobial lens of claim 45 wherein the monomer of Formula IV is present at about 0.01 to about 0.3 weight percent.

52. The antimicrobial lens of claim 45 wherein the lens is etafilcon A, balafilcon, A, aquafilcon A, lenefilcon A, or lotrafilcon A.

53. The antimicrobial lens of claim 45 wherein silver is present at about 20 ppm to about 150 ppm and the monomer of Formula IV is present at about 0.01 to about 1.5 weight percent.

54. The antimicrobial lens of claim 53 wherein the lens is etafilcon A or aquafilcon A.

55. A method of producing an antimicrobial lens comprising, silver and a polymer comprising a monomer of Formula I, II, III or IV



wherein

R^1 is hydrogen or C_{1-6} alkyl;

R^2 is $-OR^3$, $-NH-R^3$, $-S-(CH_2)_d-R^3$, or $-(CH_2)_d-R^3$, wherein

d is 0-8;

R^3 is substituted C_{1-6} alkyl

where the alkyl substituents are selected from one or more members of the group consisting of carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C_{1-6} alkyldisulfide, C_{1-6} alkylsulfide, phenyldisulfide, urea, C_{1-6} alkylurea, phenylurea, thiourea, C_{1-6} alkylthiourea, phenylthiourea, substituted C_{1-6} alkyldisulfide, substituted phenyldisulfide, substituted C_{1-6} alkylurea, substituted phenylurea, substituted C_{1-6} alkylthiourea, and substituted phenylthiourea

wherein the C_{1-6} alkyldisulfide, phenyldisulfide, C_{1-6} alkylurea, C_{1-6} alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C_{1-6} alkyl, halo C_{1-6} alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

$-(CR^4R^5)_q-(CHR^6)_m-SO_3H$

wherein R^4 , R^5 , and R^6 are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C_{1-6} alkyl,

q is 1-6, and

m is 0-6;

$-(CH_2)_n-S-S-(CH_2)_x-NH-C(O)CR^7CH_2$,

wherein R^7 is hydrogen or C_{1-6} alkyl,

n is 1-6, and

x is 1-6;



wherein R^8 , R^9 , and R^{10} are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C_{1-6} alkyl,

t is 1-6, and

u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

quinolinyl;

indolyl;

thiadiazolyl;

triazolyl;

4-methylpiperidin-1-yl;

4-methylpiperazin-1-yl;

substituted phenyl;

substituted benzyl;

substituted pyridinyl;

substituted pyrimidinyl;

substituted pyrazinyl;

substituted benzimidazolyl;

substituted benzothiazolyl;

substituted benzotriazolyl;

substituted naphthaloyl;

substituted quinolinyl;

substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid, hydroxyl, carboxylic acid, amine, amidine, N-(2-aminopyrimidine)sulfonyl, N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl, N-(2-aminopyrimidine)carbonyl, N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl, N-(2-aminopyrimidine)phosphonyl, N-(2-aminopyridine)phosphonyl, N-(aminopyrazine)phosphonyl, N-(aminobenzimidazolyl)sulfonyl, N-(aminobenzothiazolyl)sulfonyl, N-(aminobenzotriazolyl)sulfonyl, N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl, N-(aminotriazolyl)sulfonyl, N-(amino-4-methylpiperidinyl)sulfonyl, N-(amino-4-methylpiperazinyl)sulfonyl, N-(aminobenzimidazolyl)carbonyl, N-(aminobenzothiazolyl)carbonyl, N-(aminobenzotriazolyl)carbonyl, N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl, N-(aminotriazolyl)carbonyl, N-(amino-4-methylpiperidinyl)carbonyl, N-(amino-4-methylpiperazinyl)carbonyl, N-(2-aminobenzimidazolyl)phosphonyl,

N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny) phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic
 acid, amine, amidine, acetamide, and nitrile;

a is 1-5;

R¹¹ is hydrogen or C₁₋₆alkyl;

R¹² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid,
 acetamide, thioC₁₋₆alkylcarbonyl, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide,
 phenyl disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, -OR¹³, -NH-R¹³, -S-(CH₂)_d-R¹³,
 -(CH₂)_d-R¹³, -C(O)NH--(CH₂)_d-R¹³, -C(O)-(CH₂)_d-R¹³, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea,
 substituted phenylurea, substituted phenylthiourea or substituted
 C₁₋₆alkylthiourea wherein the substituents are selected from the group
 consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid,
 sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

where

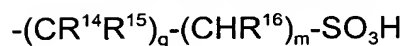
d is 0-8;

R¹³ is thioC₁₋₆alkylcarbonyl;

substituted C₁₋₆alkyl

where the alkyl substituents are selected from one or more members of the group consisting of hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea and substituted phenylthiourea

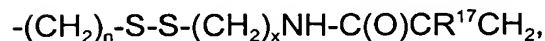
wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;



where R¹⁴, R¹⁵, and R¹⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

q is 1-6, and

m is 0-6;



where R¹⁷ is hydrogen or C₁₋₆alkyl,

n is 1-6, and

x is 1-6;



where R¹⁸, R¹⁹, and R²⁰ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

t is 1-6, and

u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

quinolinyl;

indolyl;

thiadiazolyl;

triazolyl;

4-methylpiperidin-1-yl;

4-methylpiperazin-1-yl;

substituted phenyl;

substituted benzyl;

substituted pyridinyl;

substituted pyrimidinyl;

substituted pyrazinyl;

substituted benzimidazolyl;

substituted benzothiazolyl;

substituted benzotriazolyl;

substituted naphthaloyl;

substituted quinolinyl;

substituted indolyl;

substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl

wherein the substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid, hydroxyl, carboxylic acid, amine, amidine, N-(2-aminopyrimidine)sulfonyl, N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl, N-(2-aminopyrimidine)carbonyl, N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl, N-(2-aminopyrimidine)phosphonyl, N-(2-aminopyridine)phosphonyl, N-(aminopyrazine)phosphonyl, N-(aminobenzimidazolyl)sulfonyl, N-(aminobenzothiazolyl)sulfonyl, N-(aminobenzotriazolyl)sulfonyl, N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl, N-(aminotriazolyl)sulfonyl, N-(amino-4-methylpiperidinyl)sulfonyl, N-(amino-4-methylpiperazinyl)sulfonyl, N-(aminobenzimidazolyl)carbonyl, N-(aminobenzothiazolyl)carbonyl, N-(aminobenzotriazolyl)carbonyl, N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl, N-(aminotriazolyl)carbonyl, N-(amino-4-methylpiperidinyl)carbonyl, N-(amino-4-methylpiperazinyl)carbonyl, N-(2-aminobenzimidazolyl)phosphonyl, N-(2-aminobenzothiazolyl)phosphonyl,

N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny) phosphonyl,
 N-(amino-4-methylpiperaziny) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic
 acid, amine, amidine, acetamide, and nitrile;

b is 1-5;

p is 1-5;

R²¹ is hydrogen;

R²² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid,
 thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, C₁₋₆alkyldisulfide,
 phenyldisulfide, -C(O)NH(CH₂)₁₋₆-SO₃H, -C(O)NH(CH₂)₁₋₆-P(O)(OH)₂,
 -OR²³, -NH-R²³, -C(O)NH-(CH₂)_d-R²³, -S-(CH₂)_d-R²³, -(CH₂)_d-R²³, urea,
 C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea,
 substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted
 C₁₋₆alkylurea, substituted, C₁₋₆alkylthiourea substituted phenylurea or
 substituted phenylthiourea wherein the substituents are selected from
 the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl,

carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile,

where

d is 0-8;

R^{23} is thioC₁₋₆alkylcarbonyl,

C₁₋₆alkyl,

substituted C₁₋₆alkyl

where the alkyl substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, halo C₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea, and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

$-(CR^{24}R^{25})_q-(CHR^{26})_m-SO_3H$

where R²⁴, R²⁵, and R²⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

q is 1-6, and

m is 0-6

$-(CH_2)_n-S-S-(CH_2)_xNH-C(O)CR^{27}CH_2$,

where R²⁷ is hydrogen or C₁₋₆alkyl,

n is 1-6, and

x is 1-6;

-(CR²⁸ R²⁹)_t-(CHR³⁰)_u-P(O)(OH)₂

where R²⁸, R²⁹, and R³⁰ are independently selected

from the group consisting of hydrogen, halogen,

hydroxyl, and C₁₋₆alkyl,

t is 1-6, and

u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

quinolinyl;

indolyl;

thiadiazolyl;

triazolyl;

4-methylpiperidin-1-yl;

4-methylpiperazin-1-yl;

substituted phenyl;

substituted benzyl;

substituted pyridinyl;

substituted pyrimidinyl;

substituted pyrazinyl;

substituted benzimidazolyl;

substituted benzothiazolyl;

substituted benzotriazolyl;
substituted naphthaloyl;
substituted quinolinyl;
substituted indolyl;
5 substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more
10 members of the group consisting of C₁₋₆alkyl,
haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
hydroxyl, carboxylic acid, amine, amidine,
N-(2-aminopyrimidine)sulfonyl,
N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
15 N-(2-aminopyrimidine)carbonyl,
N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
N-(2-aminopyrimidine)phosphonyl,
N-(2-aminopyridine)phosphonyl,
N-(aminopyrazine)phosphonyl,
20 N-(aminobenzimidazolyl)sulfonyl,
N-(aminobenzothiazolyl)sulfonyl,
N-(aminobenzotriazolyl)sulfonyl,
N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
N-(aminotriazolyl)sulfonyl,
25 N-(amino-4-methylpiperidinyl)sulfonyl,
N-(amino-4-methylpiperazinyl)sulfonyl,
N-(aminobenzimidazolyl)carbonyl,
N-(aminobenzothiazolyl)carbonyl,
N-(aminobenzotriazolyl)carbonyl,
30 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
N-(aminotriazolyl)carbonyl,

N-(amino-4-methylpiperidiny)carbonyl,
 N-(amino-4-methylpiperaziny)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny) phosphonyl,
 N-(amino-4-methylpiperaziny) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic
 acid, amine, amidine, acetamide, and nitrile;

w is 0-1;

Y is oxygen or sulfur;

R³¹ is hydrogen or C₁₋₆alkyl;

R³² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid,
 thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, -C(O)NH-(CH₂)_d-R³³,
 -O-R³³, -NH-R³³, -S-(CH₂)_d-R³³, -(CH₂)_d-R³³, C₁₋₆alkyldisulfide,
 phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, C₁₋₆alkylamine, phenylamine,
 substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted

phenylurea, substituted C₁₋₆alkylamine, substituted phenylamine,
 substituted phenylthiourea, substituted C₁₋₆alkylurea or substituted
 C₁₋₆alkylthiourea wherein the substituents are selected from the group
 consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid,
 sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile
 where

d is 0-8;

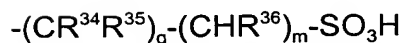
R³³ is thioC₁₋₆alkylcarbonyl,

C₁₋₆alkyl,

substituted C₁₋₆alkyl

where the alkyl substituents are selected from
 one or more members of the group consisting of
 C₁₋₆alkyl, halo C₁₋₆alkyl, halogen, hydroxyl,
 carboxylic acid, sulfonic acid, phosphonic acid,
 amine, amidine, acetamide, nitrile, thiol,
 C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide,
 urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted phenylurea,
 substituted C₁₋₆alkylthiourea or substituted
 phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl,
 halogen, hydroxyl, carboxylic acid, sulfonic acid,
 phosphonic acid, amine, amidine, acetamide, and
 nitrile;



where R³⁴, R³⁵, and R³⁶ are independently selected

from the group consisting of hydrogen, halogen,
hydroxyl, and C₁₋₆alkyl,
q is 1-6, and
m is 0-6;

5 $-(CH_2)_n-S-S-(CH_2)_x-NH-C(O)CR^{37}CH_2$,
where R³⁷ is hydrogen or C₁₋₆alkyl,
n is 1-6, and
x is 1-6;

10 $-(CR^{38}R^{39})_t-(CHR^{40})_u-P(O)(OH)_2$
where R³⁸, R³⁹, and R⁴⁰ are independently selected
from the group consisting of hydrogen, halogen,
hydroxyl, and C₁₋₆alkyl,
t is 1-6, and
u is 0-6;

15 phenyl;
benzyl;
pyridinyl;
pyrimidinyl;
pyrazinyl;
20 benzimidazolyl;
benzothiazolyl;
benzotriazolyl;
naphthaloyl;
quinolinyl;
25 indolyl;
thiadiazolyl;
triazolyl;
4-methylpiperidin-1-yl;
4-methylpiperazin-1-yl;
30 substituted phenyl;
substituted benzyl;

substituted pyridinyl;
substituted pyrimidinyl;
substituted pyrazinyl;
substituted benzimidazolyl;
substituted benzothiazolyl;
substituted benzotriazolyl;
substituted naphthaloyl;
substituted quinolinyl;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid, hydroxyl, carboxylic acid, amine, amidine, N-(2-aminopyrimidine)sulfonyl, N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl, N-(2-aminopyrimidine)carbonyl, N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl, N-(2-aminopyrimidine)phosphonyl, N-(2-aminopyridine)phosphonyl, N-(aminopyrazine)phosphonyl, N-(aminobenzimidazolyl)sulfonyl, N-(aminobenzothiazolyl)sulfonyl, N-(aminobenzotriazolyl)sulfonyl, N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl, N-(aminotriazolyl)sulfonyl, N-(amino-4-methylpiperidinyl)sulfonyl, N-(amino-4-methylpiperazinyl)sulfonyl,

N-(aminobenzimidazolyl)carbonyl,
 N-(aminobenzothiazolyl)carbonyl,
 N-(aminobenzotriazolyl)carbonyl,
 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
 N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidiny)carbonyl,
 N-(amino-4-methylpiperaziny)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny) phosphonyl,
 N-(amino-4-methylpiperaziny) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic
 acid, amine, amidine, acetamide, and nitrile;

R⁴¹ is hydrogen, C₁₋₆alkyl, phenyl, C₁₋₆alkylcarbonyl, phenylcarbonyl,
 substituted C₁₋₆alkyl, substituted phenyl, substituted C₁₋₆alkylcarbonyl
 or substituted phenylcarbonyl,

wherein

the substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile.

5

where the method comprises the steps of

(a) preparing a lens comprising a monomer of Formula I, II, III or IV and

(b) treating said lens with a silver solution.

10

56. The method of claim 55 wherein the silver solution is aqueous silver nitrate having a concentration of about 0.1 µg/mL to about .3 g/mL.

15

57. The method of claim 55 wherein, treating comprises soaking the lens comprising a polymer of a monomer of Formula I, II, III or IV with a silver solution.

20

58. The method of claim 55 wherein, the lens comprising a polymer of a monomer of Formula I, II, III or IV is soaking for about 2 minutes to about 2 hours.

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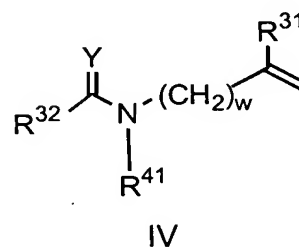
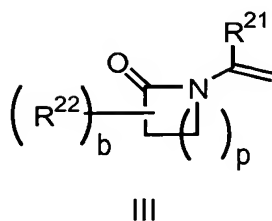
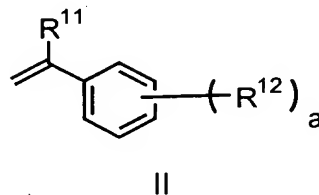
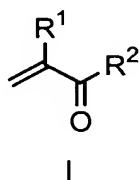
59. The method of claim 55 wherein, treating comprises storing the lens comprising a polymer of a monomer of Formula I, II, III or IV with a silver solution for about 20 minutes to about 5 years.

30

60. An antimicrobial lens comprising silver and a polymer comprising a binding monomer wherein said antimicrobial lens can reversibly bind silver.

61. The antimicrobial lens of claim 60 wherein the binding monomer has a stability constant of about 2 to about 7.3.

62. A lens case comprising silver and a polymer comprising a monomer of Formula I, II, III or IV



wherein

R¹ is hydrogen or C₁₋₆alkyl;

R² is -OR³, -NH-R³, -S-(CH₂)_d-R³, or -(CH₂)_d-R³, wherein

d is 0-8;

R³ is substituted C₁₋₆alkyl

where the alkyl substituents are selected from one or more members of the group consisting of carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea, and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and

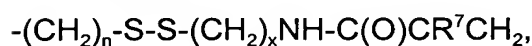
phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;



wherein R⁴, R⁵, and R⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

q is 1-6, and

10 m is 0-6;



wherein R⁷ is hydrogen or C₁₋₆alkyl,

n is 1-6, and

x is 1-6;



wherein R⁸, R⁹, and R¹⁰ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

t is 1-6, and

20 u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

25 pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

30 quinolinyl;

indolyl;

thiadiazolyl;
triazolyl;
4-methylpiperidin-1-yl;
4-methylpiperazin-1-yl;
5 substituted phenyl;
substituted benzyl;
substituted pyridinyl;
substituted pyrimidinyl;
substituted pyrazinyl;
10 substituted benzimidazolyl;
substituted benzothiazolyl;
substituted benzotriazolyl;
substituted naphthaloyl;
substituted quinolinyl;
15 substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

20 wherein the substituents are selected from one or more
members of the group consisting of C₁₋₆alkyl,
haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
hydroxyl, carboxylic acid, amine, amidine,
N-(2-aminopyrimidine)sulfonyl,
25 N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
N-(2-aminopyrimidine)carbonyl,
N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
N-(2-aminopyrimidine)phosphonyl,
N-(2-aminopyridine)phosphonyl,
30 N-(aminopyrazine)phosphonyl,
N-(aminobenzimidazolyl)sulfonyl,

5

N-(aminobenzothiazolyl)sulfonyl,
N-(aminobenzotriazolyl)sulfonyl,
N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
N-(aminotriazolyl)sulfonyl,
N-(amino-4-methylpiperidiny)lsulfonyl,
N-(amino-4-methylpiperazinyl)sulfonyl,

10

N-(aminobenzimidazolyl)carbonyl,
N-(aminobenzothiazolyl)carbonyl,
N-(aminobenzotriazolyl)carbonyl,
N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
N-(aminotriazolyl)carbonyl,

15

N-(amino-4-methylpiperidiny)carbonyl,
N-(amino-4-methylpiperazinyl)carbonyl,
N-(2-aminobenzimidazolyl)phosphonyl,
N-(2-aminobenzothiazolyl)phosphonyl,
N-(2-aminobenzotriazolyl)phosphonyl,
N-(2-aminoindolyl)phosphonyl,
N-(2-aminothiazolyl)phosphonyl,
N-(2-aminotriazolyl)phosphonyl,

20

N-(amino-4-methylpiperidiny) phosphonyl,
N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
C₁₋₆alkylthiourea, phenylthiourea, substituted
C₁₋₆alkyldisulfide, substituted phenyldisulfide,
substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
substituted phenylurea, and substituted phenylthiourea

25

30

wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
phenylthiourea substituents are selected from the
group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,

hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

a is 1-5;

R¹¹ is hydrogen or C₁₋₆alkyl;

R¹² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid, acetamide, thioC₁₋₆alkylcarbonyl, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, -OR¹³, -NH-R¹³, -S-(CH₂)_d-R¹³, -(CH₂)_d-R¹³, -C(O)NH--(CH₂)_d-R¹³, -C(O)-(CH₂)_d-R¹³, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted phenylthiourea or substituted C₁₋₆alkylthiourea wherein the substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

where

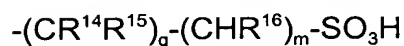
d is 0-8;

R¹³ is thioC₁₋₆alkylcarbonyl;
substituted C₁₋₆alkyl

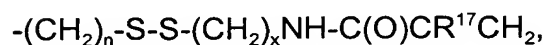
where the alkyl substituents are selected from one or more members of the group consisting of hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the

group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;



where R¹⁴, R¹⁵, and R¹⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl, q is 1-6, and m is 0-6;



where R¹⁷ is hydrogen or C₁₋₆alkyl, n is 1-6, and x is 1-6;



where R¹⁸, R¹⁹, and R²⁰ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl, t is 1-6, and u is 0-6;

phenyl;
benzyl;
pyridinyl;
pyrimidinyl;
pyrazinyl;
benzimidazolyl;
benzothiazolyl;
benzotriazolyl;
naphthaloyl;
quinolinyl;
indolyl;
thiadiazolyl;

triazolyl;
4-methylpiperidin-1-yl;
4-methylpiperazin-1-yl;
substituted phenyl;
substituted benzyl;
substituted pyridinyl;
substituted pyrimidinyl;
substituted pyrazinyl;
substituted benzimidazolyl;
substituted benzothiazolyl;
substituted benzotriazolyl;
substituted naphthaloyl;
substituted quinolinyl;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl

wherein the substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid, hydroxyl, carboxylic acid, amine, amidine, N-(2-aminopyrimidine)sulfonyl, N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl, N-(2-aminopyrimidine)carbonyl, N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl, N-(2-aminopyrimidine)phosphonyl, N-(2-aminopyridine)phosphonyl, N-(aminopyrazine)phosphonyl, N-(aminobenzimidazolyl)sulfonyl, N-(aminobenzothiazolyl)sulfonyl,

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N-(aminobenzotriazolyl)sulfonyl,
 N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
 N-(aminotriazolyl)sulfonyl,
 N-(amino-4-methylpiperidinyl)sulfonyl,
 N-(amino-4-methylpiperazinyl)sulfonyl,
 N-(aminobenzimidazolyl)carbonyl,
 N-(aminobenzothiazolyl)carbonyl,
 N-(aminobenzotriazolyl)carbonyl,
 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
 N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidinyl)carbonyl,
 N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidinyl) phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic

acid, amine, amidine, acetamide, and nitrile;

b is 1-5;

p is 1-5;

R²¹ is hydrogen;

R²² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid, thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, C₁₋₆alkyldisulfide, phenyldisulfide, -C(O)NH(CH₂)₁₋₆-SO₃H, -C(O)NH(CH₂)₁₋₆-P(O)(OH)₂, -OR²³, -NH-R²³, -C(O)NH-(CH₂)_d-R²³, -S-(CH₂)_d-R²³, -(CH₂)_d-R²³, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted, C₁₋₆alkylthiourea substituted phenylurea or substituted phenylthiourea wherein the substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile,

where

d is 0-8;

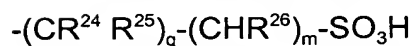
R²³ is thioC₁₋₆alkylcarbonyl,

C₁₋₆alkyl,

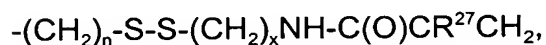
substituted C₁₋₆alkyl

where the alkyl substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, halo C₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea, and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;



where R²⁴, R²⁵, and R²⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl, q is 1-6, and m is 0-6



where R²⁷ is hydrogen or C₁₋₆alkyl, n is 1-6, and x is 1-6;



where R²⁸, R²⁹, and R³⁰ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl, t is 1-6, and u is 0-6;

phenyl;
benzyl;
pyridinyl;
pyrimidinyl;
pyrazinyl;
benzimidazolyl;
benzothiazolyl;
benzotriazolyl;
naphthaloyl;

quinolinyl;
indolyl;
thiadiazolyl;
triazolyl;
5 4-methylpiperidin-1-yl;
4-methylpiperazin-1-yl;
substituted phenyl;
substituted benzyl;
substituted pyridinyl;
10 substituted pyrimidinyl;
substituted pyrazinyl;
substituted benzimidazolyl;
substituted benzothiazolyl;
substituted benzotriazolyl;
15 substituted naphthaloyl;
substituted quinolinyl;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
20 substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more
members of the group consisting of C₁₋₆alkyl,
haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
25 hydroxyl, carboxylic acid, amine, amidine,
N-(2-aminopyrimidine)sulfonyl,
N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
N-(2-aminopyrimidine)carbonyl,
N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
30 N-(2-aminopyrimidine)phosphonyl,
N-(2-aminopyridine)phosphonyl,

N-(aminopyrazine)phosphonyl,
 N-(aminobenzimidazolyl)sulfonyl,
 N-(aminobenzothiazolyl)sulfonyl,
 N-(aminobenzotriazolyl)sulfonyl,
 5 N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
 N-(aminotriazolyl)sulfonyl,
 N-(amino-4-methylpiperidinyl)sulfonyl,
 N-(amino-4-methylpiperazinyl)sulfonyl,
 N-(aminobenzimidazolyl)carbonyl,
 10 N-(aminobenzothiazolyl)carbonyl,
 N-(aminobenzotriazolyl)carbonyl,
 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
 N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidinyl)carbonyl,
 15 N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 20 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidinyl) phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 25 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 30 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and

phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

w is 0-1;

Y is oxygen or sulfur;

R³¹ is hydrogen or C₁₋₆alkyl;

R³² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid, thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, -C(O)NH-(CH₂)_d-R³³, -O-R³³, -NH-R³³, -S-(CH₂)_d-R³³, -(CH₂)_d-R³³, C₁₋₆alkyldisulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, C₁₋₆alkylamine, phenylamine, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted phenylurea, substituted C₁₋₆alkylamine, substituted phenylamine, substituted phenylthiourea, substituted C₁₋₆alkylurea or substituted C₁₋₆alkylthiourea wherein the substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile

where

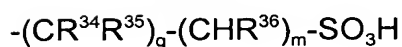
d is 0-8;

R³³ is thioC₁₋₆alkylcarbonyl,
C₁₋₆alkyl,
substituted C₁₋₆alkyl

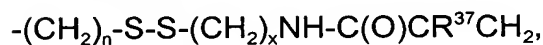
where the alkyl substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, halo C₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted

C₁₋₆alkyldisulfide, substituted phenyldisulfide,
substituted C₁₋₆alkylurea, substituted phenylurea,
substituted C₁₋₆alkylthiourea or substituted
phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
phenylthiourea substituents are selected from the
group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl,
halogen, hydroxyl, carboxylic acid, sulfonic acid,
phosphonic acid, amine, amidine, acetamide, and
nitrile;



where R³⁴, R³⁵, and R³⁶ are independently selected
from the group consisting of hydrogen, halogen,
hydroxyl, and C₁₋₆alkyl,
q is 1-6, and
m is 0-6;



where R³⁷ is hydrogen or C₁₋₆alkyl,
n is 1-6, and
x is 1-6;



where R³⁸, R³⁹, and R⁴⁰ are independently selected
from the group consisting of hydrogen, halogen,
hydroxyl, and C₁₋₆alkyl,
t is 1-6, and
u is 0-6;

phenyl;
benzyl;
pyridinyl;
pyrimidinyl;

pyrazinyl;
 benzimidazolyl;
 benzothiazolyl;
 benzotriazolyl;
 5 naphthaloyl;
 quinolinyl;
 indolyl;
 thiadiazolyl;
 triazolyl;
 10 4-methylpiperidin-1-yl;
 4-methylpiperazin-1-yl;
 substituted phenyl;
 substituted benzyl;
 substituted pyridinyl;
 15 substituted pyrimidinyl;
 substituted pyrazinyl;
 substituted benzimidazolyl;
 substituted benzothiazolyl;
 substituted benzotriazolyl;
 20 substituted naphthaloyl;
 substituted quinolinyl;
 substituted indolyl;
 substituted thiadiazolyl;
 substituted triazolyl;
 25 substituted 4-methylpiperidin-1-yl; or
 substituted 4-methylpiperazin-1-yl,
 wherein the substituents are selected from one or more
 members of the group consisting of C₁₋₆alkyl,
 haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
 30 hydroxyl, carboxylic acid, amine, amidine,
 N-(2-aminopyrimidine)sulfonyl,

5

10

15

20

25

30

N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
N-(2-aminopyrimidine)carbonyl,
N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
N-(2-aminopyrimidine)phosphonyl,
N-(2-aminopyridine)phosphonyl,
N-(aminopyrazine)phosphonyl,
N-(aminobenzimidazolyl)sulfonyl,
N-(aminobenzothiazolyl)sulfonyl,
N-(aminobenzotriazolyl)sulfonyl,
N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
N-(aminotriazolyl)sulfonyl,
N-(amino-4-methylpiperidinyl)sulfonyl,
N-(amino-4-methylpiperazinyl)sulfonyl,
N-(aminobenzimidazolyl)carbonyl,
N-(aminobenzothiazolyl)carbonyl,
N-(aminobenzotriazolyl)carbonyl,
N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
N-(aminotriazolyl)carbonyl,
N-(amino-4-methylpiperidinyl)carbonyl,
N-(amino-4-methylpiperazinyl)carbonyl,
N-(2-aminobenzimidazolyl)phosphonyl,
N-(2-aminobenzothiazolyl)phosphonyl,
N-(2-aminobenzotriazolyl)phosphonyl,
N-(2-aminoindolyl)phosphonyl,
N-(2-aminothiazolyl)phosphonyl,
N-(2-aminotriazolyl)phosphonyl,
N-(amino-4-methylpiperidinyl) phosphonyl,
N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
C₁₋₆alkylthiourea, phenylthiourea, substituted

C₁₋₆alkyldisulfide, substituted phenyldisulfide,
substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
substituted phenylurea, and substituted phenylthiourea

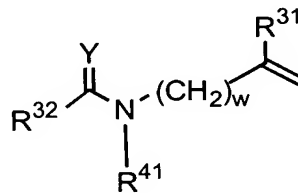
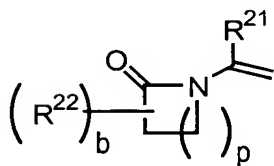
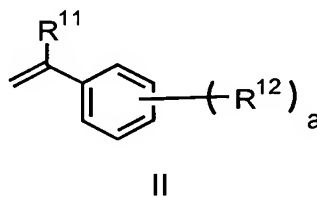
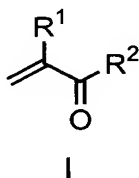
wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
phenylthiourea substituents are selected from the
group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
hydroxyl, carboxylic acid, sulfonic acid, phosphonic
acid, amine, amidine, acetamide, and nitrile;

R⁴¹ is hydrogen, C₁₋₆alkyl, phenyl, C₁₋₆alkylcarbonyl, phenylcarbonyl,
substituted C₁₋₆alkyl, substituted phenyl, substituted C₁₋₆alkylcarbonyl
or substituted phenylcarbonyl,

wherein

the substituents are selected from the group consisting of
C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid,
sulfonic acid, phosphonic acid, amine, amidine, acetamide,
and nitrile.

63. A method of reducing the adverse effects associated with microbial
production in the eye of a mammal comprising providing an antimicrobial
lens, wherein said lens comprises, silver and a polymer comprising a
monomer of the Formula I, II, III or IV



wherein

R^1 is hydrogen or C_{1-6} alkyl;

R^2 is $-OR^3$, $-NH-R^3$, $-S-(CH_2)_d-R^3$, or $-(CH_2)_d-R^3$, wherein

d is 0-8;

R^3 is substituted C_{1-6} alkyl

where the alkyl substituents are selected from one or more members of the group consisting of carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C_{1-6} alkyldisulfide, C_{1-6} alkylsulfide, phenyldisulfide, urea, C_{1-6} alkylurea, phenylurea, thiourea, C_{1-6} alkylthiourea, phenylthiourea, substituted C_{1-6} alkyldisulfide, substituted phenyldisulfide, substituted C_{1-6} alkylurea, substituted phenylurea, substituted C_{1-6} alkylthiourea, and substituted phenylthiourea

wherein the C_{1-6} alkyldisulfide, phenyldisulfide, C_{1-6} alkylurea, C_{1-6} alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C_{1-6} alkyl, halo C_{1-6} alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

$-(CR^4R^5)_q-(CHR^6)_m-SO_3H$

wherein R^4 , R^5 , and R^6 are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C_{1-6} alkyl,

q is 1-6, and

m is 0-6;

$-(CH_2)_n-S-S-(CH_2)_x-NH-C(O)CR^7CH_2$,

wherein R^7 is hydrogen or C_{1-6} alkyl,

n is 1-6, and

x is 1-6;



wherein R^8 , R^9 , and R^{10} are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C_{1-6} alkyl,

t is 1-6, and

u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

quinolinyl;

indolyl;

thiadiazolyl;

triazolyl;

4-methylpiperidin-1-yl;

4-methylpiperazin-1-yl;

substituted phenyl;

substituted benzyl;

substituted pyridinyl;

substituted pyrimidinyl;

substituted pyrazinyl;

substituted benzimidazolyl;

substituted benzothiazolyl;

substituted benzotriazolyl;

substituted naphthaloyl;
substituted quinolinyll;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more
members of the group consisting of C₁₋₆alkyl,
haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
hydroxyl, carboxylic acid, amine, amidine,
N-(2-aminopyrimidine)sulfonyl,
N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
N-(2-aminopyrimidine)carbonyl,
N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
N-(2-aminopyrimidine)phosphonyl,
N-(2-aminopyridine)phosphonyl,
N-(aminopyrazine)phosphonyl,
N-(aminobenzimidazolyl)sulfonyl,
N-(aminobenzothiazolyl)sulfonyl,
N-(aminobenzotriazolyl)sulfonyl,
N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
N-(aminotriazolyl)sulfonyl,
N-(amino-4-methylpiperidinyl)sulfonyl,
N-(amino-4-methylpiperazinyl)sulfonyl,
N-(aminobenzimidazolyl)carbonyl,
N-(aminobenzothiazolyl)carbonyl,
N-(aminobenzotriazolyl)carbonyl,
N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
N-(aminotriazolyl)carbonyl,
N-(amino-4-methylpiperidinyl)carbonyl,

N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidinyl) phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic
 acid, amine, amidine, acetamide, and nitrile;

a is 1-5;

R¹¹ is hydrogen or C₁₋₆alkyl;

R¹² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid,
 acetamide, thioC₁₋₆alkylcarbonyl, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide,
 phenyl disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, -OR¹³, -NH-R¹³, -S-(CH₂)_d-R¹³,
 -(CH₂)_d-R¹³, -C(O)NH--(CH₂)_d-R¹³, -C(O) -(CH₂)_d-R¹³, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea,
 substituted phenylurea, substituted phenylthiourea or substituted
 C₁₋₆alkylthiourea wherein the substituents are selected from the group

consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

where

d is 0-8;

R¹³ is thioC₁₋₆alkylcarbonyl;

substituted C₁₋₆alkyl

where the alkyl substituents are selected from one or more members of the group consisting of hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

$-(CR^{14}R^{15})_q-(CHR^{16})_m-SO_3H$

where R¹⁴, R¹⁵, and R¹⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

q is 1-6, and

m is 0-6;

$-(CH_2)_n-S-S-(CH_2)_x-NH-C(O)CR^{17}CH_2$,

where R¹⁷ is hydrogen or C₁₋₆alkyl,

n is 1-6, and

x is 1-6;



where R^{18} , R^{19} , and R^{20} are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C_{1-6} alkyl,

t is 1-6, and

u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

quinolinyl;

indolyl;

thiadiazolyl;

triazolyl;

4-methylpiperidin-1-yl;

4-methylpiperazin-1-yl;

substituted phenyl;

substituted benzyl;

substituted pyridinyl;

substituted pyrimidinyl;

substituted pyrazinyl;

substituted benzimidazolyl;

substituted benzothiazolyl;

substituted benzotriazolyl;

substituted naphthaloyl;

substituted quinolinyl;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
5 substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl

wherein the substituents are selected from one or more
members of the group consisting of C₁₋₆alkyl,
haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid,
10 hydroxyl, carboxylic acid, amine, amidine,
N-(2-aminopyrimidine)sulfonyl,
N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl,
N-(2-aminopyrimidine)carbonyl,
N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl,
15 N-(2-aminopyrimidine)phosphonyl,
N-(2-aminopyridine)phosphonyl,
N-(aminopyrazine)phosphonyl,
N-(aminobenzimidazolyl)sulfonyl,
N-(aminobenzothiazolyl)sulfonyl,
20 N-(aminobenzotriazolyl)sulfonyl,
N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl,
N-(aminotriazolyl)sulfonyl,
N-(amino-4-methylpiperidinyl)sulfonyl,
N-(amino-4-methylpiperazinyl)sulfonyl,
25 N-(aminobenzimidazolyl)carbonyl,
N-(aminobenzothiazolyl)carbonyl,
N-(aminobenzotriazolyl)carbonyl,
N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
N-(aminotriazolyl)carbonyl,
30 N-(amino-4-methylpiperidinyl)carbonyl,
N-(amino-4-methylpiperazinyl)carbonyl,

N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny) phosphonyl,
 N-(amino-4-methylpiperaziny) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic
 acid, amine, amidine, acetamide, and nitrile;

b is 1-5;

p is 1-5;

R²¹ is hydrogen;

R²² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid,
 thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, C₁₋₆alkyldisulfide,
 phenyldisulfide, -C(O)NH(CH₂)₁₋₆-SO₃H, -C(O)NH(CH₂)₁₋₆-P(O)(OH)₂,
 -OR²³, -NH-R²³, -C(O)NH-(CH₂)_d-R²³, -S-(CH₂)_d-R²³, -(CH₂)_d-R²³, urea,
 C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea,
 substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted
 C₁₋₆alkylurea, substituted, C₁₋₆alkylthiourea substituted phenylurea or
 substituted phenylthiourea wherein the substituents are selected from

the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile,

where

d is 0-8;

R²³ is thioC₁₋₆alkylcarbonyl,

C₁₋₆alkyl,

substituted C₁₋₆alkyl

where the alkyl substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, halo C₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea, and substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;

$-(\text{CR}^{24} \text{R}^{25})_q-(\text{CHR}^{26})_m-\text{SO}_3\text{H}$

where R²⁴, R²⁵, and R²⁶ are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C₁₋₆alkyl,

q is 1-6, and

m is 0-6

$-(CH_2)_n-S-S-(CH_2)_xNH-C(O)CR^{27}CH_2,$

where R^{27} is hydrogen or C_{1-6} alkyl,

n is 1-6, and

x is 1-6;

$-(CR^{28}R^{29})_t-(CHR^{30})_u-P(O)(OH)_2$

where R^{28} , R^{29} , and R^{30} are independently selected

from the group consisting of hydrogen, halogen,

hydroxyl, and C_{1-6} alkyl,

t is 1-6, and

u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

quinolinyl;

indolyl;

thiadiazolyl;

triazolyl;

4-methylpiperidin-1-yl;

4-methylpiperazin-1-yl;

substituted phenyl;

substituted benzyl;

substituted pyridinyl;

substituted pyrimidinyl;

substituted pyrazinyl;

substituted benzimidazolyl;

substituted benzothiazolyl;
substituted benzotriazolyl;
substituted naphthaloyl;
substituted quinolinyl;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid, hydroxyl, carboxylic acid, amine, amidine, N-(2-aminopyrimidine)sulfonyl, N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl, N-(2-aminopyrimidine)carbonyl, N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl, N-(2-aminopyrimidine)phosphonyl, N-(2-aminopyridine)phosphonyl, N-(aminopyrazine)phosphonyl, N-(aminobenzimidazolyl)sulfonyl, N-(aminobenzothiazolyl)sulfonyl, N-(aminobenzotriazolyl)sulfonyl, N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl, N-(aminotriazolyl)sulfonyl, N-(amino-4-methylpiperidinyl)sulfonyl, N-(amino-4-methylpiperazinyl)sulfonyl, N-(aminobenzimidazolyl)carbonyl, N-(aminobenzothiazolyl)carbonyl, N-(aminobenzotriazolyl)carbonyl, N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,

N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidiny)carbonyl,
 N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 N-(amino-4-methylpiperidiny) phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic
 acid, amine, amidine, acetamide, and nitrile;

w is 0-1;

Y is oxygen or sulfur;

R³¹ is hydrogen or C₁₋₆alkyl;

R³² is hydroxyl, sulfonic acid, phosphonic acid, carboxylic acid,
 thioC₁₋₆alkylcarbonyl, thioC₁₋₆alkylaminocarbonyl, -C(O)NH-(CH₂)_d-R³³,
 -O-R³³, -NH-R³³, -S-(CH₂)_d-R³³, -(CH₂)_d-R³³, C₁₋₆alkyldisulfide,
 phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, C₁₋₆alkylamine, phenylamine,

substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted phenylurea, substituted C₁₋₆alkylamine, substituted phenylamine, substituted phenylthiourea, substituted C₁₋₆alkylurea or substituted C₁₋₆alkylthiourea wherein the substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile

where

d is 0-8;

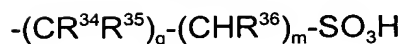
R³³ is thioC₁₋₆alkylcarbonyl,

C₁₋₆alkyl,

substituted C₁₋₆alkyl

where the alkyl substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, halo C₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyldisulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea, C₁₋₆alkylthiourea, phenylthiourea, substituted C₁₋₆alkyldisulfide, substituted phenyldisulfide, substituted C₁₋₆alkylurea, substituted phenylurea, substituted C₁₋₆alkylthiourea or substituted phenylthiourea

wherein the C₁₋₆alkyldisulfide, phenyldisulfide, C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and phenylthiourea substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile;



where R^{34} , R^{35} , and R^{36} are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C_{1-6} alkyl,

q is 1-6, and

m is 0-6;

$-(CH_2)_n-S-S-(CH_2)_x-NH-C(O)CR^{37}CH_2$,

where R^{37} is hydrogen or C_{1-6} alkyl,

n is 1-6, and

x is 1-6;

$-(CR^{38}R^{39})_t-(CHR^{40})_u-P(O)(OH)_2$

where R^{38} , R^{39} , and R^{40} are independently selected from the group consisting of hydrogen, halogen, hydroxyl, and C_{1-6} alkyl,

t is 1-6, and

u is 0-6;

phenyl;

benzyl;

pyridinyl;

pyrimidinyl;

pyrazinyl;

benzimidazolyl;

benzothiazolyl;

benzotriazolyl;

naphthaloyl;

quinolinyl;

indolyl;

thiadiazolyl;

triazolyl;

4-methylpiperidin-1-yl;

4-methylpiperazin-1-yl;

substituted phenyl;

substituted benzyl;
substituted pyridinyl;
substituted pyrimidinyl;
substituted pyrazinyl;
substituted benzimidazolyl;
substituted benzothiazolyl;
substituted benzotriazolyl;
substituted naphthaloyl;
substituted quinolinyl;
substituted indolyl;
substituted thiadiazolyl;
substituted triazolyl;
substituted 4-methylpiperidin-1-yl; or
substituted 4-methylpiperazin-1-yl,

wherein the substituents are selected from one or more members of the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, sulfonic acid, phosphonic acid, hydroxyl, carboxylic acid, amine, amidine, N-(2-aminopyrimidine)sulfonyl, N-(aminopyridine)sulfonyl, N-(aminopyrazine)sulfonyl, N-(2-aminopyrimidine)carbonyl, N-(aminopyridine)carbonyl, N-(aminopyrazine)carbonyl, N-(2-aminopyrimidine)phosphonyl, N-(2-aminopyridine)phosphonyl, N-(aminopyrazine)phosphonyl, N-(aminobenzimidazolyl)sulfonyl, N-(aminobenzothiazolyl)sulfonyl, N-(aminobenzotriazolyl)sulfonyl, N-(aminoindolyl)sulfonyl, N-(aminothiazolyl)sulfonyl, N-(aminotriazolyl)sulfonyl, N-(amino-4-methylpiperidinyl)sulfonyl,

N-(amino-4-methylpiperazinyl)sulfonyl,
 N-(aminobenzimidazolyl)carbonyl,
 N-(aminobenzothiazolyl)carbonyl,
 N-(aminobenzotriazolyl)carbonyl,
 5 N-(aminoindolyl)carbonyl, N-(aminothiazolyl)carbonyl,
 N-(aminotriazolyl)carbonyl,
 N-(amino-4-methylpiperidinyl)carbonyl,
 N-(amino-4-methylpiperazinyl)carbonyl,
 N-(2-aminobenzimidazolyl)phosphonyl,
 10 N-(2-aminobenzothiazolyl)phosphonyl,
 N-(2-aminobenzotriazolyl)phosphonyl,
 N-(2-aminoindolyl)phosphonyl,
 N-(2-aminothiazolyl)phosphonyl,
 N-(2-aminotriazolyl)phosphonyl,
 15 N-(amino-4-methylpiperidinyl) phosphonyl,
 N-(amino-4-methylpiperazinyl) phosphonyl, acetamide,
 nitrile, thiol, C₁₋₆alkyldisulfide, C₁₋₆alkylsulfide, phenyl
 disulfide, urea, C₁₋₆alkylurea, phenylurea, thiourea,
 C₁₋₆alkylthiourea, phenylthiourea, substituted
 20 C₁₋₆alkyldisulfide, substituted phenyldisulfide,
 substituted C₁₋₆alkylurea, substituted C₁₋₆alkylthiourea,
 substituted phenylurea, and substituted phenylthiourea
 wherein the C₁₋₆alkyldisulfide, phenyldisulfide,
 C₁₋₆alkylurea, C₁₋₆alkylthiourea, phenylurea, and
 25 phenylthiourea substituents are selected from the
 group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen,
 hydroxyl, carboxylic acid, sulfonic acid, phosphonic
 acid, amine, amidine, acetamide, and nitrile;
 R⁴¹ is hydrogen, C₁₋₆alkyl, phenyl, C₁₋₆alkylcarbonyl, phenylcarbonyl,
 30 substituted C₁₋₆alkyl, substituted phenyl, substituted C₁₋₆alkylcarbonyl
 or substituted phenylcarbonyl,

wherein

the substituents are selected from the group consisting of C₁₋₆alkyl, haloC₁₋₆alkyl, halogen, hydroxyl, carboxylic acid, sulfonic acid, phosphonic acid, amine, amidine, acetamide, and nitrile.

5

64. An antimicrobial lens comprising silver, wherein said lens has sufficient movement on the eye of a patient.

10 65. The lens of claim 64 having about 50 to about 100 percent movement.

66. The lens of claim 64 having about 75 to about 100 percent movement.

67. The lens of claim 64 having about 90 to about 100 percent movement.

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68. An antimicrobial lens comprising silver, wherein said lens inhibits microbial production by at least 25%.

69. The lens of claim 68 wherein said lens inhibits microbial production by at least about 50% to at least about 99%.

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70. The lens of claim 68 wherein said lens inhibits microbial production by at least about 80% to at least about 99%.

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71. An antimicrobial lens comprising silver, wherein said lens has sufficient movement on the eye of a patient and said lens inhibits microbial production by at least 25%.

72. The lens of claim 71 having about 50% to about 100% movement and said lens inhibits microbial production by 75% to about 100%.

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